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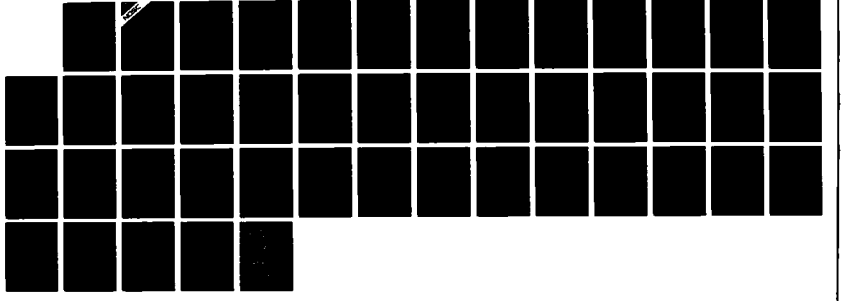

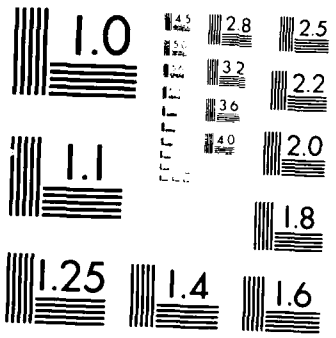

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September 1987

Worldwide Distributions of Shipboard Surface Meteorological Observations for EM Propagation Analysis

K. D. Anderson

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E. G. SCHWEIZER, CAPT, USN
Commander

R. M. HILLYER
Technical Director

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The Naval Ocean Systems Center (NOSC) sponsored the National Climatic Data Center, Asheville, North Carolina to produce a subset analysis of its Standard Tape Deck Family 11 (STD-11) database.

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CONTENTS

page

BACKGROUND 1

GENERAL DUCT63 DATABASE DESCRIPTION 3

DUCT63 DATABASE QUANTITIES 3

- Paulus Evaporation Duct Height 4
- Paulus Evaporation Duct Height Crossed with Jeske Duct Height 4
- Wind Speed 4
- Absolute Humidity 4
- Modified Air-Sea Temperature Difference 4
- Rain Rate 5
- Gaseous Attenuation Rate at 35 GHz 5
- Gaseous Attenuation Rate at 94 GHz 5
- Total Attenuation at 35 GHz 5
- Total Attenuation at 94 GHZ 6
- Paulus Duct Height Crossed with Wind Speed 6

REFERENCES 40

Accession For

A-1

BACKGROUND

The Naval Ocean Systems Center (NOSC) sponsored the National Climatic Data Center, Asheville, North Carolina to produce a subset analysis of its Standard Tape Deck Family 11 (STD-11) database. The STD-11 database consists of over 150 years of worldwide surface meteorological observations such as wind speed, present weather, air temperature, and other meteorological quantities. These observations were assembled from ship logs, ship weather reporting forms, published ship observations, automatic buoys, teletype reports, and card decks purchased from foreign meteorological services.

The subset analysis, known as DUCT63, covers 293 Marsden squares and spans 15 years of surface observations from 1970 through 1984. A Marsden square is a region of the earth's surface defined by a grid of 10 degrees latitude by 10 degrees longitude and is assigned a unique identification number. Figure 1 shows the location and the numerical assignment of all Marsden squares. For example, Marsden square 1 is defined as the region bounded by the prime meridian to 10 degrees west longitude and from the equator to 10 degrees north latitude. Not all of the 648 possible Marsden squares are included in the DUCT63 analysis for two reasons. First, the analysis is specifically concerned with the maritime environment. Marsden squares not containing a region of ocean are excluded from the data. Second, a requirement of at least 100 valid observations per month was imposed to reduce the effects of any spurious meteorological measurements on the distributions. Figure 1 shows the location of the Marsden squares contained within the DUCT 63 analysis as the region enclosed by the heavy border.

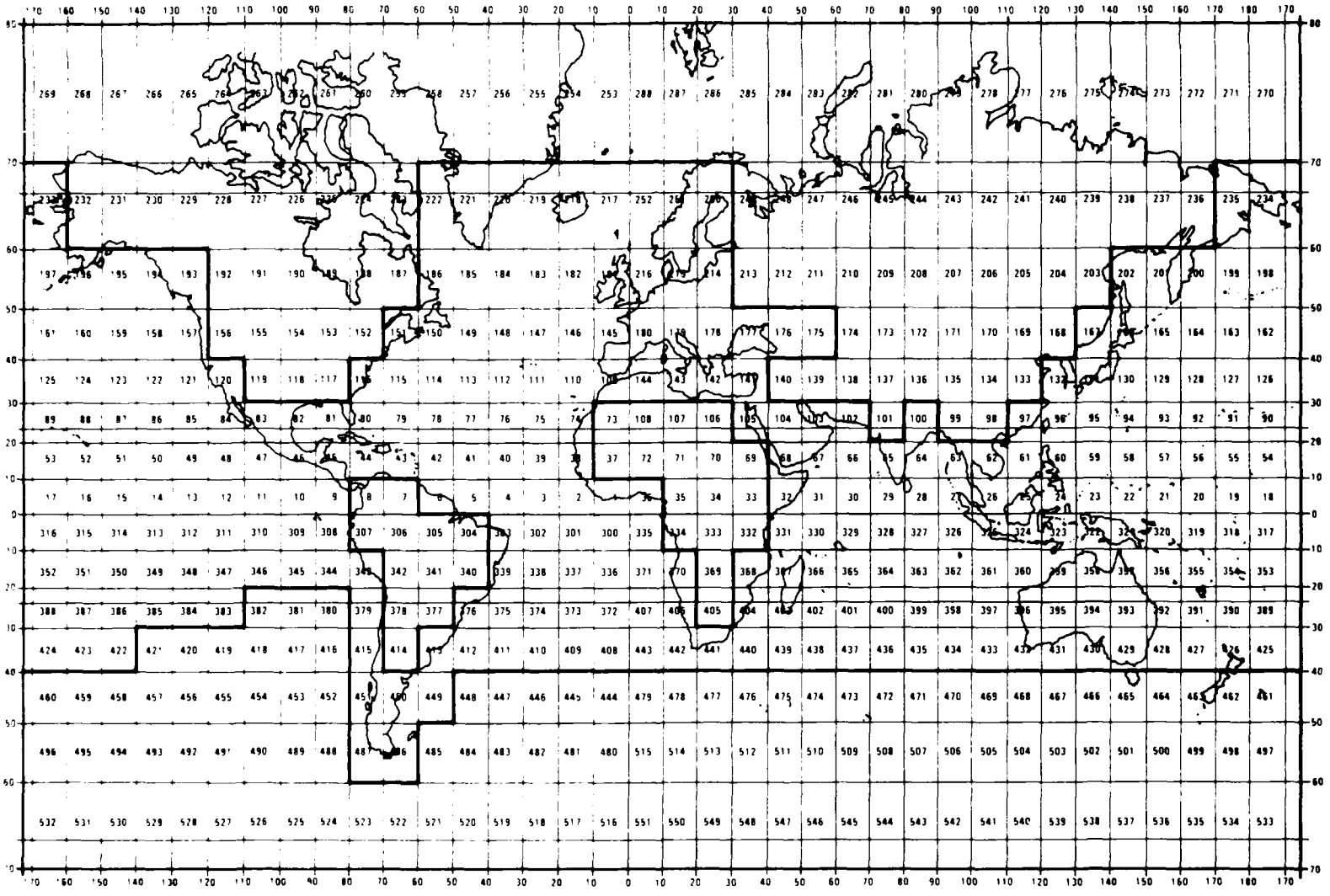

Figure 1. Geographical location of Marsden square data in the DUCT63 analysis.

GENERAL DUCT63 DATABASE DESCRIPTION

The DUCT63 analysis contains distributions of meteorological quantities and surface-to-surface attenuation rates for frequencies of 35 and 94 GHz. These distributions are expressed as tables of either a probability or a percentage of time that the quantity is observed within a specified range. The distributions include diurnal effects where day or daytime categories imply a positive solar angle within the Marsden square at the time of the meteorological observation. Night categories are times of observation between one hour after the local sunset and one hour before the local sunrise. Observations taken in the interval between the day and night categories are excluded from the data set.

There are two forms of distributions: a probability (or percent of time) distribution for a specific quantity (e.g., wind speed) and a joint probability distribution of two quantities. The latter form, also called a cross distribution, is specifically designed for use by NOSC in its research efforts.

Each page of tables is labeled with the Marsden square number and the period of record (POR). The POR is expressed as QQRR-SSTT where QQ is the starting year, RR is the starting month, SS is the ending year and TT is the ending month. Generally, the POR is 7001-8412 indicating that the data is comprised of observations taken between January 1970 and December 1984. The probability distributions of specific quantities include the mean value of the quantity and the number of valid observations that the distribution is derived from. The cross distributions indicate the number of valid observations.

DUCT63 DATABASE QUANTITIES

The following quantities are distributed within the DUCT63 analysis and are tabularized on microfiche in the same order:

- Paulus evaporation duct height (meters)
- Paulus evaporation duct height crossed with Jeske duct height
- Wind speed (meters per second)
- Absolute humidity (grams per cubic meter)
- Modified air-sea temperature difference (degree C)
- Rain rate (scaled millimeters per hour)
- Attenuation rate (gaseous) at 35 GHz (scaled dB/km)
- Attenuation rate (gaseous) at 94 GHz (scaled dB/km)
- Attenuation rate (total) at 35 GHz (scaled dB/km)
- Attenuation rate (total) at 94 GHz (scaled dB/km)
- Paulus evaporation duct height crossed with wind speed

The quantities of evaporation duct height and the modified air-sea temperature difference are generally of no concern to the casual user of the data. Details of the specific quantities and distribution characteristics are described in the following paragraphs.

PAULUS EVAPORATION DUCT HEIGHT

The Paulus formulation of evaporation duct height calculations (reference 1) is a modification to the classical Jeske method (reference 2). The major difference in the approaches is that the Paulus technique attempts to account for inaccuracies in air temperature observations which are caused by thermal influence of the ship. The distributions of duct height are in 2-meter intervals from 0 to 40 meters and two additional categories – duct heights greater than 40 meters and duct heights that are not calculable (undefined). Figures 2 through 4 are the results from Marsden square 1. Note the label indicating the mean sub square (mean sub sq) 25. Marsden squares are subdivided into 1-degree sub squares and this label (25) shows the mean location of all of the observations within the analysis for this square. Under each distribution are the values of the mean height and the first through third quartile. From figure 2, a duct height in the interval of 10 to 12 meters for a January day is observed 14.4 percent of the time (the probability is 0.144). The mean height of the duct for a March night period is 11.0 meters. There were 2,229 valid observations found in constructing the distribution for the April day period.

PAULUS EVAPORATION DUCT HEIGHT CROSSED WITH JESKE DUCT HEIGHT

Figures 5 through 7 tabulate the joint probability of a duct height computed by the Paulus and Jeske methods for Marsden square 1. The distributions are in 2 meter intervals as described above. To obtain a reasonable format of the tables, the true probability is scaled by a factor 10,000. For example, the joint probability of finding a Paulus and Jeske duct height in the interval of 10 to 12 meters in Marsden square 1 during daylight hours is given in figure 5 as 0.0749. Also, the total number of valid observations used to construct figure 5 is given at the bottom of the table and is 23,552.

WIND SPEED

Figures 8 through 10 show the distributions of wind speed, in meters per second (m/s), for Marsden square 1. From figure 8, the mean wind speed during January night conditions is 3.7 m/s which is derived from 1,739 valid observations. A wind speed between 5 and 6 m/s is observed 12.2 percent of the time during February daylight hours.

ABSOLUTE HUMIDITY

Figures 11 through 13 show examples of absolute humidity distributions. The categories are in grams per cubic meter ($g\ m^3$). During March daylight hours, the mean absolute humidity is 22.6 $g\ m^3$. Absolute humidity is observed 48.6 percent of the time for the interval 21 to 23 $g\ m^3$.

MODIFIED AIR-SEA TEMPERATURE DIFFERENCE

Reference 1 defines the modified air-sea temperature difference. Its purpose for inclusion within the DUCT63 database is to aid NOSC research efforts in the climatological description of evaporation duct heights. Figures 14 through 16 show examples of the distribution format.

RAIN RATE

Figures 17 through 19 show rain-rate distributions for Marsden square 1. Rain rate is not a directly reported quantity in the STD-11 database. Rather, it is computed from the present weather code by techniques developed by Goroch (reference 3). The categories of distribution are tabularized scaled by a factor of 100. From figure 17, the rain rate is reported to occur 0.4 percent of the time in the range of 1.26 to 1.51 millimeters per hour (mm/hr) during a January day time period. The mean rain rate for a March day time period is reported as 0.067 mm/hr and is derived from 1,712 reports of present weather.

GASEOUS ATTENUATION RATE AT 35 GHz

Figures 20 through 22 are the distributions of gaseous attenuation rate at a frequency of 35 GHz for Marsden square 1. This quantity is derived from observations of air temperature, relative humidity, and visibility.

The reported visibility is used to calculate a value of the liquid water content based on the work of Johnson reported by Cook (reference 4). Methods described by Liebe (reference 5) are used to calculate the attenuation rate. Since the meteorological data is surface data, the attenuation rate is valid only for surface-to-surface propagation. It is not applicable for use with slant paths.

In the tables, the labeled attenuation rates are scaled by a factor of 1,000. From figure 20, the mean attenuation rate for a January night is 0.2593 dB/km. The distribution indicates that an attenuation rate between 0.226 and 0.251 dB/km is observed to occur 26.7 percent of the tme.

GASEOUS ATTENUATION RATE AT 94 GHz

The description above applies to the tables shown in figures 23 through 25 with two exceptions. First, the frequency is 94 GHz and second, the scaling factor is 100, not 1,000 as above. From figure 23, the surface-to-surface attenuation rate (at 94 GHz) is observed to fall between 1.01 and 1.26 dB/km 58.9 percent of the time during a February night period. The mean value is 1.24 dB/km.

TOTAL ATTENUATION AT 35 GHz

The major difference between the attenuation rate described for this quantity and the attenuation rate described above is that the total attenuation includes the effects of rain rate. The contributions from rain rate are modeled after the work of Falcone (reference 6).

Figures 26 through 28 are the results for Marsden square 1. From figure 26, the mean attenuation rate for an April day period is 0.3028 dB/km (the categories are scaled by a factor of 1,000). The distribution for the same period indicates an attenuation rate between 0.251 and 0.276 dB/km is observed 50.7 percent of the time.

TOTAL ATTENUATION AT 94 GHz

The comments of the preceding section are directly applicable for the total attenuation rate at 94 GHz. Again, it should be stressed that the meteorological data are observed at the surface and the attenuation rates described are strictly applicable to a surface-to-surface path. That is, the data are not applicable to a slant path.

Figures 29 through 31 present tables of the total attenuation rate at a frequency of 94 GHz for Marsden square 1. From figure 29, the attenuation rate for an April day period is observed 53.1 percent of the time in the interval 1.01 to 1.26 dB/km. The mean attenuation rate is 1.408 dB/km for the same period.

PAULUS DUCT HEIGHT CROSSED WITH WIND SPEED

Similar to the cross distribution discussed previously, figures 32 through 34 present the cross distribution of the Paulus duct height and wind speed. These tables are designed primarily for use by NOSC in the determination of evaporation ducting.

MARSDEN SQUARE: 1 MEAN SUB SQ=25 PAULUS DUCT HEIGHT DISTRIBUTION POR = 7001-8412 REV: 6.3

DUCT HEIGHT (METERS)	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	DUCT HEIGHT (METERS)
0-2	.7	.9	.7	1.8	.5	1.7	.5	.7	00-02
2-4	1.6	1.3	2.7	4.7	1.5	3.5	1.2	1.9	02-04
4-6	4.3	4.1	5.9	9.6	4.7	8.9	6.1	9.2	04-06
6-8	7.6	7.9	9.0	10.3	9.3	10.5	7.8	8.0	06-08
8-10	12.9	16.1	11.0	13.6	11.2	13.8	11.6	14.6	08-10
10-12	14.4	21.9	14.0	17.2	14.7	21.6	17.0	19.0	10-12
12-14	15.4	17.7	13.8	15.8	15.3	15.7	15.1	18.3	12-14
14-16	14.1	13.3	12.9	11.9	14.5	11.3	12.7	13.6	14-16
16-18	11.4	6.5	12.4	6.4	11.3	8.2	10.9	7.8	16-18
18-20	4.5	2.3	8.6	4.6	8.1	3.0	8.3	4.0	18-20
20-22	2.2	.7	5.7	3.0	4.0	1.2	3.6	1.6	20-22
22-24	1.3	.4	2.1	.7	2.7	.3	2.2	.8	22-24
24-26	.5	.1	.9	.0	.9	.1	1.1	.6	24-26
26-28	.3	.1	.1	.2	.9	.0	.8	.1	26-28
28-30	.2	.1	.1	.1	.2	.0	.4	.0	28-30
30-32	.1	.0	.1	.0	.1	.1	.3	.0	30-32
32-34	.0	.0	.2	.0	.0	.0	.2	.0	32-34
34-36	.0	.0	.0	.0	.0	.0	.0	.0	34-36
36-38	.1	.0	.0	.0	.0	.0	.0	.0	36-38
38-40	.0	.0	.0	.0	.0	.0	.0	.0	38-40
>=40	.0	.0	.0	.0	.0	.0	.0	.0	>= 40
UNDEFINED	.0	.0	.0	.0	.0	.0	.0	.0	UNDEFINED
MEAN HGHT:	11.6	10.9	13.0	11.1	13.2	11.0	13.1	11.7	MEAN HGHT
1ST QTL HGT:	9.1	8.2	9.2	7.7	9.6	8.0	9.6	8.7	1ST QTL HGT
2ND QTL HGT:	12.6	11.9	13.0	11.2	13.0	11.1	12.8	11.7	2ND QTL HGT
3RD QTL HGT:	15.8	13.6	16.8	14.3	16.6	13.9	16.5	14.5	3RD QTL HGT
VALID OBS:	1672	1739	1497	1617	1712	1443	2229	1055	VALID OBS

MAXIMUM DUCT HEIGHT SET TO: 50. METRES

Figure 2 Paulus evaporation duct height

MARSDEN SQUARE: 1 MEAN SFB SQ=15 PAULUS DUCT HEIGHT DISTRIBUTION POR = 7001-8412 REV: 6.3

DUCT HEIGHT (METERS)	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	DUCT HEIGHT (METERS)
00-02	.4	.2	.6	.8	1.4	3.0	2.5	2.9	00-02
02-04	.7	1.4	1.1	1.2	2.6	4.2	3.1	5.1	02-04
04-06	3.6	3.5	2.6	2.7	5.1	6.0	5.8	8.0	04-06
06-08	6.2	5.2	6.3	7.7	6.1	9.3	9.3	12.7	06-08
08-10	10.4	10.8	10.4	11.2	9.8	10.3	13.3	13.9	08-10
10-12	14.6	15.4	13.3	15.3	11.0	14.0	15.6	15.9	10-12
12-14	14.5	17.3	12.7	15.7	14.5	16.2	14.8	15.5	12-14
14-16	13.9	17.5	13.0	15.4	13.9	15.4	12.9	11.5	14-16
16-18	12.8	11.9	13.2	11.7	13.0	10.3	9.1	6.9	16-18
18-20	9.7	8.6	11.4	8.8	8.3	6.0	6.6	4.6	18-20
20-22	5.9	5.3	7.0	5.0	6.8	3.2	4.5	1.8	20-22
22-24	4.0	1.9	5.0	2.6	4.0	1.3	1.6	.9	22-24
24-26	1.7	.5	2.0	1.3	2.2	.5	.4	.2	24-26
26-28	.9	.0	.9	.6	.8	.3	.2	.0	26-28
28-30	.5	.1	.2	.0	.2	.0	.2	.1	28-30
30-32	.3	.2	.2	.0	.1	.0	.2	.0	30-32
32-34	.1	.0	.1	.0	.0	.0	.0	.0	32-34
34-36	.0	.0	.0	.0	.0	.0	.0	.0	34-36
36-38	.0	.0	.0	.0	.0	.0	.0	.0	36-38
38-40	.0	.0	.0	.0	.0	.0	.0	.0	38-40
>= 40	.0	.0	.0	.0	.0	.0	.0	.0	>= 40
UNDEFINED	.0	.0	.0	.0	.0	.0	.0	.0	UNDEFINED
MEAN HGHT:	14.3	13.5	14.6	13.6	13.8	12.0	12.2	10.9	MEAN HGHT
1ST QTL HGT:	10.5	10.5	10.6	10.2	10.0	8.5	8.6	7.4	1ST QTL HGT
2ND QTL HGT:	14.0	13.5	14.5	13.4	13.9	12.4	12.1	10.9	2ND QTL HGT
3RD QTL HGT:	17.7	16.6	18.3	16.9	17.6	15.6	15.6	14.2	3RD QTL HGT
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

MAXIMUM DUCT HEIGHT SET TO: 50. METRES

Figure 3. Paulus evaporation duct height.

MARSDEN SQUARE: 1 MEAN SUB SQ=25 PAULUS DUCT HEIGHT DISTRIBUTION POR = 7001-8412 REV: 6.3

DUCT HEIGHT (METERS)	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	DUCT HEIGHT (METERS)
00-02	2.1	2.4	1.1	.8	.1	.3	.5	.2	00-02
02-04	4.0	4.3	1.2	1.8	1.1	1.1	1.5	1.7	02-04
04-06	7.4	7.4	3.0	4.3	3.8	4.2	6.2	6.5	04-06
06-08	9.4	13.5	5.5	8.8	5.9	9.1	8.7	7.9	06-08
08-10	14.5	15.4	10.0	16.4	9.4	16.9	10.7	14.8	08-10
10-12	13.8	19.5	13.3	19.6	16.5	22.2	15.1	24.4	10-12
12-14	15.0	15.1	17.2	19.9	18.6	20.2	17.6	18.2	12-14
14-16	13.3	11.5	16.5	16.1	18.1	14.6	14.6	12.8	14-16
16-18	10.0	6.5	15.4	7.8	12.2	6.6	12.0	7.0	16-18
18-20	5.3	2.5	8.6	2.5	7.2	3.3	6.3	3.7	18-20
20-22	2.8	.8	5.1	1.5	3.5	.9	3.1	1.5	20-22
22-24	1.6	.6	1.9	.5	2.0	.4	2.0	.8	22-24
24-26	.6	.1	.9	.2	.8	.2	.8	.2	24-26
26-28	.2	.2	.3	.1	.3	.0	.4	.1	26-28
28-30	.1	.1	.0	.0	.3	.0	.2	.1	28-30
30-32	.0	.0	.1	.0	.0	.0	.1	.0	30-32
32-34	.0	.0	.0	.0	.0	.1	.2	.0	32-34
34-36	.0	.0	.0	.0	.0	.0	.0	.0	34-36
36-38	.0	.0	.0	.0	.0	.0	.0	.0	36-38
38-40	.0	.0	.0	.0	.0	.0	.0	.0	38-40
>=40	.0	.0	.0	.0	.0	.0	.0	.0	>= 40
UNDEFINED	.0	.0	.0	.0	.0	.0	.0	.0	UNDEFINED
MEAN HGHT:	11.8	10.7	13.7	11.8	13.4	11.7	12.9	11.7	MEAN HGHT
1ST QTL HGT:	8.3	7.6	10.6	9.2	10.6	9.2	9.5	9.2	1ST QTL HGT
2ND QTL HGT:	11.8	10.7	13.9	11.8	13.4	11.7	12.8	11.5	2ND QTL HGT
3RD QTL HGT:	15.3	13.7	16.9	14.5	16.2	14.1	16.0	14.2	3RD QTL HGT
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

MAXIMUM DUCT HEIGHT SET TO: 50. METRES

Figure 4. Paulus evaporation duct height.

MARSDEN SQUARE: 1 PAULUS DUCT HEIGHT VS JESKE DUCT HEIGHT REVISION: 6.3
FOR:7001-8412

PROBABILITY*1E4: DAYTIME

DUCT HEIGHT (M)	JESKE DUCT HEIGHT <	2-	4-	6-	8-	10-	12-	14-	16-	18-	20-	22-	24-	26-	28-	30-	32-	34-	36-	38-	40>	40	UNDF	DUCT HEIGHT (M)
00-02	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	00-02
02-04	17	118	9	2	1	1	1	1	3	0	0	1	2	3	2	2	1	1	0	1	12	0	0	02-04
04-06	19	4	278	35	8	5	4	2	2	4	3	4	5	2	3	2	2	2	2	2	101	0	0	04-06
06-08	17	2	9	416	58	25	9	8	8	4	4	2	2	6	5	5	3	2	2	1	169	0	0	06-08
08-10	15	3	6	5	612	115	37	19	17	8	7	6	10	4	5	4	3	5	4	3	231	0	0	08-10
10-12	12	3	3	2	9	749	144	63	36	25	20	14	13	8	5	5	5	4	4	0	306	0	0	10-12
12-14	11	0	2	2	2	6	714	177	79	43	34	21	28	18	16	6	10	7	5	2	323	0	0	12-14
14-16	4	1	1	2	1	2	4	636	174	75	47	33	17	17	16	13	11	6	4	6	334	0	0	14-16
16-18	1	0	0	2	1	0	2	1	515	156	71	41	32	22	15	11	12	9	8	11	267	0	0	16-18
18-20	0	0	0	0	0	0	1	2	0	323	111	55	29	20	14	16	9	5	8	6	197	0	0	18-20
20-22	0	0	0	0	0	0	0	0	0	0	174	69	34	22	14	9	3	8	4	4	122	0	0	20-22
22-24	0	0	0	0	0	0	0	0	0	0	0	89	29	17	13	12	5	5	3	4	89	0	0	22-24
24-26	0	0	0	0	0	0	0	0	0	0	0	0	32	14	8	2	2	5	1	2	43	0	0	24-26
26-28	0	0	0	0	0	0	0	0	0	0	0	0	0	14	3	4	4	1	0	1	23	0	0	26-28
28-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	1	0	0	0	13	0	0	28-30
30-32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	7	0	0	30-32
32-34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	32-34
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
36-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36-38
38-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38-40
>= 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>= 40
UNDF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UNDF

OBS : 23552(23552) SCALED: 23552.01 RATIO : 1.000

Figure 5. Paulus duct height crossed with Jeske.

MARSDEN SQUARE: 1
FOR: 7001-8412

PAULUS DUCT HEIGHT VS
JESKE DUCT HEIGHT

REVISION: 6.3

PROBABILITY*1E4: NIGHT
JESKE DUCT HEIGHT

DUCT HEIGHT (M)	2-	4-	6-	8-	10-	12-	14-	16-	18-	20-	22-	24-	26-	28-	30-	32-	34-	36-	38-	40>	40	UNDF	DUCT HEIGHT (M)
00-02	121	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	00-02
02-04	14	209	16	3	2	1	2	1	1	2	0	0	0	1	2	1	1	1	1	0	9	0	02-04
04-06	14	4	496	45	5	4	2	1	2	3	2	2	2	2	0	3	1	1	2	4	51	0	04-06
06-08	8	1	9	677	90	24	10	11	10	2	3	3	3	1	3	2	1	1	2	2	72	0	06-08
08-10	8	2	4	5	1012	138	45	23	21	5	6	6	9	3	4	3	2	2	3	2	112	0	08-10
10-12	3	2	1	6	3	1306	222	65	43	24	16	19	9	7	9	7	2	2	3	5	145	0	10-12
12-14	1	2	0	0	1	3	1125	243	78	52	27	15	26	16	9	5	7	2	3	3	103	0	12-14
14-16	0	0	0	0	0	2	1	889	199	72	40	30	13	7	4	7	4	7	4	5	76	0	14-16
16-18	0	0	0	0	0	0	1	2	479	122	53	22	23	8	6	5	2	5	1	2	48	0	16-18
18-20	0	0	0	0	0	0	0	0	0	262	60	25	16	7	6	4	6	2	3	3	29	0	18-20
20-22	0	0	0	0	0	0	0	0	0	1	122	29	19	4	0	2	1	2	2	3	19	0	20-22
22-24	0	0	0	0	0	0	0	0	0	0	0	55	14	3	2	1	1	0	0	1	6	0	22-24
24-26	0	0	0	0	0	0	0	0	0	0	0	0	13	9	2	1	0	0	0	0	2	0	24-26
26-28	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	3	0	26-28
28-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	28-30
30-32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	30-32
32-34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32-34
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
36-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36-38
38-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38-40
>= 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>= 40
UNDF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UNDF

OBS : 17724(17724) SCALED: 17723.98 RATIO : 1.000

Figure 6. Paulus duct height crossed with Jeske.

MARSDEN SQUARE: 1
POR: 7001-8412

PAULUS DUCT HEIGHT VS JESKE DUCT HEIGHT

REVISION: 6.3

PROBABILITY*1E4: COMBINED JESKE DUCT HEIGHT

DUCT HEIGHT (M)	< 2-	4-	6-	8-	10-	12-	14-	16-	18-	20-	22-	24-	26-	28-	30-	32-	34-	36-	38-	40>	40	UNDF	DUCT HEIGHT (M)
00-02	107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	00-02
02-04	16	157	12	3	1	1	2	1	2	1	0	0	1	2	2	2	1	1	0	0	11	0	02-04
04-06	17	4	372	39	7	4	3	2	2	3	3	3	4	2	2	2	2	1	2	3	79	0	04-06
06-08	13	2	9	528	72	25	9	9	9	3	4	2	3	4	4	4	2	1	2	1	127	0	06-08
08-10	12	2	5	5	783	125	40	21	19	7	7	6	9	4	5	4	3	4	4	3	180	0	08-10
10-12	8	3	2	4	7	988	177	64	39	25	18	16	11	7	7	6	4	3	4	2	237	0	10-12
12-14	7	1	1	1	1	5	891	205	78	47	31	18	27	17	13	6	9	5	4	3	228	0	12-14
14-16	2	0	0	1	0	2	2	745	185	73	44	31	15	13	11	10	8	7	4	6	223	0	14-16
16-18	0	0	0	1	0	0	1	1	500	141	63	32	28	16	11	9	8	7	5	7	173	0	16-18
18-20	0	0	0	0	0	0	0	1	0	297	89	42	23	15	10	11	8	4	6	5	125	0	18-20
20-22	0	0	0	0	0	0	0	0	0	0	152	52	28	15	8	6	2	5	3	4	78	0	20-22
22-24	0	0	0	0	0	0	0	0	0	0	0	75	23	11	8	7	3	2	2	2	53	0	22-24
24-26	0	0	0	0	0	0	0	0	0	0	0	0	24	12	5	2	1	2	0	1	26	0	24-26
26-28	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2	2	2	0	0	0	15	0	26-28
28-30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	8	0	28-30
30-32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	4	0	30-32
32-34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	32-34
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
36-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36-38
38-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38-40
>= 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>= 40
UNDF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UNDF

OBS : 41276(41276) SCALED: 41275.98 RATIO : 1.000

Figure 7. Paulus duct height crossed with Jeske.

MARSDEN SQUARE: 1 WIND SPEED (M/SEC) REVISION: 6.3
POR:7001-8412

WIND SPEED (M/S)	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	WIND SPEED (M/S)
WIND < 0	.0	.0	.0	.0	.0	.0	.0	.0	WIND < 0
0< WIND < 1	7.4	7.6	6.5	7.9	5.7	6.9	7.2	7.8	0< WIND < 1
1< WIND < 2	12.3	11.6	14.0	12.1	13.3	12.3	11.4	11.8	1< WIND < 2
2< WIND < 3	21.1	22.1	18.2	17.9	21.7	24.0	23.9	23.5	2< WIND < 3
3< WIND < 4	12.6	12.5	12.2	14.3	15.8	13.8	12.2	14.1	3< WIND < 4
4< WIND < 5	18.3	17.9	18.7	18.7	19.9	21.7	18.7	20.5	4< WIND < 5
5< WIND < 6	13.3	13.8	12.2	13.7	10.6	10.5	10.5	9.4	5< WIND < 6
6< WIND < 7	8.5	8.6	10.2	8.8	6.4	5.5	8.4	6.6	6< WIND < 7
7< WIND < 8	3.2	3.0	4.8	4.1	3.4	3.3	3.9	3.3	7< WIND < 8
8< WIND < 9	1.9	1.8	2.4	1.4	1.8	.9	2.0	2.0	8< WIND < 9
9< WIND < 10	.7	.4	.5	.5	.6	.7	.9	.4	9< WIND < 10
10< WIND < 11	.5	.3	.1	.3	.5	.3	.4	.2	10< WIND < 11
11< WIND < 12	.2	.0	.1	.0	.0	.1	.0	.0	11< WIND < 12
12< WIND < 13	.1	.1	.1	.1	.1	.0	.3	.1	12< WIND < 13
13< WIND < 14	.1	.1	.1	.0	.1	.0	.0	.1	13< WIND < 14
14< WIND < 15	.0	.0	.0	.0	.1	.0	.0	.0	14< WIND < 15
15< WIND < 16	.0	.0	.1	.2	.0	.0	.0	.2	15< WIND < 16
16< WIND < 17	.0	.0	.0	.0	.1	.0	.0	.0	16< WIND < 17
17< WIND < 18	.0	.0	.0	.0	.0	.0	.0	.0	17< WIND < 18
18< WIND < 19	.0	.0	.0	.0	.0	.0	.0	.0	18< WIND < 19
19< WIND < 20	.0	.0	.0	.0	.0	.0	.0	.0	19< WIND < 20
20< WIND	.0	.1	.0	.0	.0	.0	.0	.0	20< WIND
MEAN:	3.7	3.7	3.8	3.7	3.6	3.5	3.7	3.6	MEAN
VALID OBS:	1672	1739	1497	1617	1712	1443	2229	1055	VALID OBS

Figure 8. Wind speed.

MARSDEN SQUARE: 1 WIND SPEED (M/SEC) REVISION: 6.3
POR:7001-8412

WIND SPEED (M/S)	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	WIND SPEED (M/S)
WIND < 0	.0	.0	.0	.0	.0	.0	.0	.0	WIND < 0
0< WIND < 1	3.5	3.3	1.1	.7	1.7	2.3	1.7	1.8	0< WIND < 1
1< WIND < 2	7.9	6.2	3.3	2.4	5.0	5.3	5.4	3.7	1< WIND < 2
2< WIND < 3	15.3	16.0	9.7	8.4	10.1	10.1	11.6	12.5	2< WIND < 3
3< WIND < 4	12.1	10.1	6.9	7.5	8.8	8.8	10.2	9.6	3< WIND < 4
4< WIND < 5	19.3	21.4	19.5	20.5	18.4	24.8	21.1	24.4	4< WIND < 5
5< WIND < 6	13.0	14.4	15.4	18.0	17.0	16.4	14.3	15.9	5< WIND < 6
6< WIND < 7	13.1	13.4	19.0	19.3	16.9	13.3	15.4	13.2	6< WIND < 7
7< WIND < 8	6.6	8.0	10.5	9.6	9.0	8.9	9.3	9.2	7< WIND < 8
8< WIND < 9	5.1	4.6	7.2	6.3	5.9	3.6	4.5	4.4	8< WIND < 9
9< WIND < 10	2.6	2.0	4.7	3.7	3.4	3.8	3.8	3.0	9< WIND < 10
10< WIND < 11	.7	.4	1.6	2.2	2.3	1.7	1.6	1.2	10< WIND < 11
11< WIND < 12	.5	.1	.6	.4	.7	.5	.3	.2	11< WIND < 12
12< WIND < 13	.1	.1	.4	.5	.4	.2	.6	.9	12< WIND < 13
13< WIND < 14	.1	.1	.0	.2	.3	.0	.1	.1	13< WIND < 14
14< WIND < 15	.0	.0	.1	.0	.0	.0	.0	.0	14< WIND < 15
15< WIND < 16	.1	.1	.1	.1	.0	.0	.1	.0	15< WIND < 16
16< WIND < 17	.0	.0	.0	.0	.0	.0	.0	.0	16< WIND < 17
17< WIND < 18	.0	.0	.0	.0	.0	.0	.0	.0	17< WIND < 18
18< WIND < 19	.0	.0	.0	.0	.0	.1	.0	.0	18< WIND < 19
19< WIND < 20	.0	.0	.0	.0	.0	.0	.0	.0	19< WIND < 20
20< WIND	.0	.0	.0	.2	.0	.1	.0	.0	20< WIND
MEAN:	4.6	4.6	5.6	5.6	5.3	5.1	5.1	5.1	MEAN
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

Figure 9. Wind speed.

MARSDEN SQUARE: 1 WIND SPEED (M/SEC) REVISION: 6.3
YEAR: 1981-8412

WIND SPEED (M/S)	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	WIND SPEED (M/S)
WIND < 0	.0	.0	.0	.0	.0	.0	.0	.0	WIND < 0
0< WIND < 1	3.3	1.6	2.3	1.5	4.1	2.8	8.7	5.9	0< WIND < 1
1< WIND < 2	6.6	5.5	3.9	3.8	9.5	7.9	15.0	10.8	1< WIND < 2
2< WIND < 3	13.0	14.2	13.8	12.5	21.3	19.3	21.1	24.1	2< WIND < 3
3< WIND < 4	11.5	10.3	9.5	10.0	12.8	14.6	12.6	13.6	3< WIND < 4
4< WIND < 5	20.3	21.7	22.9	26.4	20.5	24.2	17.9	19.9	4< WIND < 5
5< WIND < 6	15.1	14.8	14.1	16.9	13.6	14.6	11.4	11.2	5< WIND < 6
6< WIND < 7	13.5	15.0	17.8	14.9	9.3	9.8	7.6	8.2	6< WIND < 7
7< WIND < 8	7.1	8.6	8.0	7.7	5.7	3.9	2.9	3.2	7< WIND < 8
8< WIND < 9	4.5	3.8	2.8	3.0	1.5	1.4	1.7	1.6	8< WIND < 9
9< WIND < 10	3.2	2.2	3.2	2.2	1.1	.7	.6	.9	9< WIND < 10
10< WIND < 11	.7	1.3	1.1	.8	.3	.3	.4	.2	10< WIND < 11
11< WIND < 12	.3	.1	.1	.1	.1	.2	.0	.2	11< WIND < 12
12< WIND < 13	.6	.6	.1	.0	.0	.0	.0	.0	12< WIND < 13
13< WIND < 14	.0	.1	.0	.1	.0	.1	.1	.0	13< WIND < 14
14< WIND < 15	.0	.0	.1	.1	.0	.1	.0	.1	14< WIND < 15
15< WIND < 16	.1	.1	.1	.1	.0	.0	.0	.0	15< WIND < 16
16< WIND < 17	.0	.0	.0	.0	.0	.0	.0	.0	16< WIND < 17
17< WIND < 18	.0	.0	.0	.0	.0	.0	.0	.0	17< WIND < 18
18< WIND < 19	.0	.0	.0	.0	.0	.0	.0	.0	18< WIND < 19
19< WIND < 20	.0	.0	.1	.0	.0	.0	.0	.0	19< WIND < 20
20< WIND	.0	.0	.0	.0	.1	.1	.0	.0	20< WIND
MEAN:	4.8	4.9	5.0	4.9	4.0	4.1	3.5	3.7	MEAN
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

Figure 10 Wind speed.

MARSDEN SQUARE: 1 ABSOLUTE HUMIDITY (G/M**3) REVISION: 6.3
POR:7001-8412

ABSOLUTE HUMIDITY G/M**3	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	ABSOLUTE HUMIDITY G/M**3
ABSH < 1	.0	.0	.0	.0	.0	.0	.0	.0	ABSH < 1
1< ABSH < 3	.0	.0	.0	.0	.0	.0	.0	.0	1< ABSH < 3
3< ABSH < 5	.0	.0	.0	.0	.0	.0	.0	.0	3< ABSH < 5
5< ABSH < 7	.0	.0	.0	.0	.0	.0	.0	.0	5< ABSH < 7
7< ABSH < 9	.0	.0	.0	.0	.0	.0	.0	.0	7< ABSH < 9
9< ABSH < 11	.1	.0	.0	.0	.0	.0	.0	.0	9< ABSH < 11
11< ABSH < 13	.2	.0	.0	.0	.0	.0	.0	.0	11< ABSH < 13
13< ABSH < 15	.4	.3	.1	.0	.1	.0	.0	.0	13< ABSH < 15
15< ABSH < 17	.8	.9	.2	.4	.3	.3	.3	.2	15< ABSH < 17
17< ABSH < 19	3.2	2.6	1.5	2.7	1.5	1.5	1.7	1.5	17< ABSH < 19
19< ABSH < 21	20.5	24.1	13.8	16.3	13.4	15.8	14.8	15.2	19< ABSH < 21
21< ABSH < 23	47.7	47.7	52.6	56.0	48.6	48.1	49.0	49.6	21< ABSH < 23
23< ABSH < 25	22.1	20.9	24.1	21.2	26.6	27.2	24.3	26.0	23< ABSH < 25
25< ABSH < 27	4.4	3.3	6.5	3.0	7.2	6.2	7.3	6.8	25< ABSH < 27
27< ABSH < 29	.5	.2	.9	.5	2.0	.8	2.0	.8	27< ABSH < 29
29< ABSH < 31	.1	.0	.3	.0	.3	.0	.4	.0	29< ABSH < 31
31< ABSH < 33	.0	.0	.0	.0	.0	.0	.0	.0	31< ABSH < 33
33< ABSH < 35	.0	.0	.0	.0	.0	.0	.0	.0	33< ABSH < 35
35< ABSH < 37	.0	.0	.0	.0	.0	.0	.0	.0	35< ABSH < 37
37< ABSH < 39	.0	.0	.0	.0	.0	.0	.0	.0	37< ABSH < 39
39< ABSH < 41	.0	.0	.0	.0	.0	.0	.0	.0	39< ABSH < 41
41< ABSH	.0	.0	.0	.0	.0	.0	.0	.0	41< ABSH
MEAN:	22.0	21.9	22.5	22.2	22.6	22.4	22.5	22.5	MEAN
VALID OBS:	1672	1739	1497	1617	1712	1443	2229	1055	VALID OBS

Figure 11. Absolute humidity.

MARSDEN SQUARE: 1 ABSOLUTE HUMIDITY (G/M**3) REVISION: 6.3
POR: 7001-8412

ABSOLUTE HUMIDITY G/M**3	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	ABSOLUTE HUMIDITY G/M**3
ABSH < 1	.0	.0	.0	.0	.0	.0	.0	.0	ABSH < 1
1< ABSH < 3	.0	.0	.0	.0	.0	.0	.0	.0	1< ABSH < 3
3< ABSH < 5	.0	.0	.0	.0	.0	.0	.0	.0	3< ABSH < 5
5< ABSH < 7	.0	.0	.0	.0	.0	.0	.0	.0	5< ABSH < 7
7< ABSH < 9	.0	.0	.0	.0	.0	.0	.0	.0	7< ABSH < 9
9< ABSH < 11	.0	.0	.0	.0	.0	.0	.0	.0	9< ABSH < 11
11< ABSH < 13	1	.0	.0	.0	.1	.1	.0	.0	11< ABSH < 13
13< ABSH < 15	.0	.0	.2	.0	.4	.3	.6	.4	13< ABSH < 15
15< ABSH < 17	.3	.4	2.3	2.6	10.9	11.5	11.3	12.3	15< ABSH < 17
17< ABSH < 19	3.6	3.2	17.7	18.7	44.1	44.8	38.2	42.3	17< ABSH < 19
19< ABSH < 21	24.9	25.0	49.7	50.5	36.4	35.8	41.3	38.0	19< ABSH < 21
21< ABSH < 23	52.9	56.0	25.5	25.1	6.6	6.7	7.7	6.7	21< ABSH < 23
23< ABSH < 25	15.2	13.2	3.8	2.4	1.2	.8	.8	.3	23< ABSH < 25
25< ABSH < 27	2.3	1.9	.7	.7	.2	.0	.0	.0	25< ABSH < 27
27< ABSH < 29	.7	.1	.2	.0	.1	.1	.0	.0	27< ABSH < 29
29< ABSH < 31	.1	.0	.0	.0	.0	.0	.0	.0	29< ABSH < 31
31< ABSH < 33	.0	.0	.0	.0	.0	.0	.0	.0	31< ABSH < 33
33< ABSH < 35	.0	.0	.0	.0	.0	.0	.0	.0	33< ABSH < 35
35< ABSH < 37	.0	.0	.0	.0	.0	.0	.0	.0	35< ABSH < 37
37< ABSH < 39	.0	.0	.0	.0	.0	.0	.0	.0	37< ABSH < 39
39< ABSH < 41	.0	.0	.0	.0	.0	.0	.0	.0	39< ABSH < 41
41< ABSH	.0	.0	.0	.0	.0	.0	.0	.0	41< ABSH
MEAN:	21.8	21.7	20.3	20.2	18.9	18.8	18.9	18.8	MEAN
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

Figure 12. Absolute humidity

MARSDEN SQUARE: 1 ABSOLUTE HUMIDITY (G/M**3) REVISION: 6.3
POR:7001-8412

ABSOLUTE HUMIDITY G/M**3	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	ABSOLUTE HUMIDITY G/M**3
ABSH < 1	.0	.0	.0	.0	.0	.0	.0	.0	ABSH < 1
1< ABSH < 3	.0	.0	.0	.0	.0	.0	.0	.0	1< ABSH < 3
3< ABSH < 5	.0	.0	.0	.0	.0	.0	.0	.0	3< ABSH < 5
5< ABSH < 7	.0	.0	.0	.0	.0	.0	.0	.0	5< ABSH < 7
7< ABSH < 9	.0	.0	.0	.0	.0	.0	.0	.0	7< ABSH < 9
9< ABSH < 11	.0	.0	.0	.0	.0	.0	.0	.0	9< ABSH < 11
11< ABSH < 13	.0	.0	.0	.0	.0	.0	.2	.0	11< ABSH < 13
13< ABSH < 15	.1	.2	.1	.3	.0	.0	.3	.4	13< ABSH < 15
15< ABSH < 17	4.6	4.0	1.5	1.8	.5	.1	.7	1.2	15< ABSH < 17
17< ABSH < 19	26.3	27.0	14.1	14.6	3.9	4.7	5.3	3.6	17< ABSH < 19
19< ABSH < 21	52.9	53.3	48.8	52.7	36.7	36.7	32.1	29.8	19< ABSH < 21
21< ABSH < 23	15.1	14.6	29.6	27.7	44.7	47.2	45.8	52.2	21< ABSH < 23
23< ABSH < 25	.8	.8	4.5	2.8	12.2	9.7	11.5	10.2	23< ABSH < 25
25< ABSH < 27	.1	.2	1.2	.2	1.6	1.7	3.0	2.3	25< ABSH < 27
27< ABSH < 29	.0	.0	.1	.0	.4	.0	1.2	.1	27< ABSH < 29
29< ABSH < 31	.0	.0	.0	.0	.0	.0	.0	.0	29< ABSH < 31
31< ABSH < 33	.0	.0	.0	.0	.0	.0	.0	.0	31< ABSH < 33
33< ABSH < 35	.0	.0	.0	.0	.0	.0	.0	.0	33< ABSH < 35
35< ABSH < 37	.0	.0	.0	.0	.0	.0	.0	.0	35< ABSH < 37
37< ABSH < 39	.0	.0	.0	.0	.0	.0	.0	.0	37< ABSH < 39
39< ABSH < 41	.0	.0	.0	.0	.0	.0	.0	.0	39< ABSH < 41
41< ABSH	.0	.0	.0	.0	.0	.0	.0	.0	41< ABSH
MEAN:	19.6	19.6	20.5	20.3	21.4	21.3	21.5	21.5	MEAN
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

Figure 13. Absolute humidity.

MARSDEN SQUARE: 1
PER:7001-8412

MODIFIED AIR-SEA TEMPERATURE (C)

REVISION: 6.3

MAIR-SEA TEMP DEG C	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	MAIR-SEA TEMP DEG C
MA-S <-10	.0	.0	.0	.0	.0	.0	.0	.0	MA-S <-10
-10< MA-S < -9	.0	.0	.0	.0	.0	.0	.0	.0	-10< MA-S < -9
-9< MA-S < -8	.0	.0	.0	.0	.0	.0	.0	.0	-9< MA-S < -8
-8< MA-S < -7	.0	.0	.0	.0	.1	.0	.0	.0	-8< MA-S < -7
-7< MA-S < -6	.0	.1	.0	.0	.0	.1	.2	.2	-7< MA-S < -6
-6< MA-S < -5	.0	.4	.0	.2	.2	.3	.4	.4	-6< MA-S < -5
-5< MA-S < -4	.5	.6	.4	.9	.6	1.0	1.1	.9	-5< MA-S < -4
-4< MA-S < -3	2.2	2.8	.7	2.0	1.9	3.0	4.4	4.0	-4< MA-S < -3
-3< MA-S < -2	3.5	7.2	3.1	6.3	4.1	7.7	8.8	10.9	-3< MA-S < -2
-2< MA-S < -1	13.3	23.7	7.4	16.8	11.3	19.9	19.2	25.8	-2< MA-S < -1
-1< MA-S < 0	79.2	63.8	86.4	70.7	80.2	65.6	64.6	56.1	-1< MA-S < 0
0< MA-S < 1	1.0	1.1	1.3	1.8	.9	2.0	.9	1.4	0< MA-S < 1
1< MA-S < 2	.2	.2	.5	.5	.3	.3	.1	.1	1< MA-S < 2
2< MA-S < 3	.1	.1	.0	.4	.1	.1	.1	.1	2< MA-S < 3
3< MA-S < 4	.1	.0	.1	.2	.2	.0	.1	.1	3< MA-S < 4
4< MA-S < 5	.0	.1	.1	.0	.0	.0	.0	.0	4< MA-S < 5
5< MA-S < 6	.0	.1	.1	.0	.0	.0	.0	.0	5< MA-S < 6
6< MA-S < 7	.0	.0	.0	.0	.0	.0	.0	.0	6< MA-S < 7
7< MA-S < 8	.0	.0	.0	.0	.0	.0	.0	.0	7< MA-S < 8
8< MA-S < 9	.0	.0	.0	.0	.0	.0	.0	.0	8< MA-S < 9
9< MA-S < 10	.0	.0	.0	.0	.0	.0	.0	.0	9< MA-S < 10
10< MA-S	.0	.0	.0	.0	.0	.0	.0	.0	10< MA-S
MEAN:	-1.2	-1.3	-1.1	-1.2	-1.2	-1.3	-1.4	-1.4	MEAN
VALID OBS:	1672	1379	1407	1617	1712	1443	2229	1055	VALID OBS

Figure 13 Marsden square temperature difference

MARSDEN SQUARE: 1 MODIFIED AIR-SEA TEMPERATURE (C) REVISION: 6.3
POR:7001-8412

MAIR-SEA TEMP DEG C	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	MAIR-SEA TEMP DEG C
MA-S <-10	.0	.0	.0	.0	.0	.0	.0	.0	MA-S <-10
-10< MA-S < -9	.0	.0	.0	.0	.0	.0	.0	.0	-10< MA-S < -9
-9< MA-S < -8	.0	.0	.0	.0	.0	.0	.0	.0	-9< MA-S < -8
-8< MA-S < -7	.0	.1	.0	.0	.0	.1	.0	.2	-8< MA-S < -7
-7< MA-S < -6	.5	.0	.0	.0	.0	.1	.0	.1	-7< MA-S < -6
-6< MA-S < -5	.4	.6	.2	.2	.1	.4	.2	.3	-6< MA-S < -5
-5< MA-S < -4	1.4	.7	.8	1.2	.9	1.0	.4	.8	-5< MA-S < -4
-4< MA-S < -3	4.4	4.7	3.8	3.9	2.6	3.1	1.4	2.0	-4< MA-S < -3
-3< MA-S < -2	10.5	13.7	8.1	10.5	7.6	10.5	4.7	7.1	-3< MA-S < -2
-2< MA-S < -1	23.7	29.8	22.6	28.0	20.7	27.1	15.5	23.5	-2< MA-S < -1
-1< MA-S < 0	57.7	49.4	59.7	50.7	64.4	52.6	72.1	57.1	-1< MA-S < 0
0< MA-S < 1	.9	.7	4.3	5.3	2.5	3.2	4.1	6.9	0< MA-S < 1
1< MA-S < 2	.4	.1	.4	.2	.7	1.3	1.0	1.5	1< MA-S < 2
2< MA-S < 3	.2	.1	.1	.0	.1	.6	.4	.3	2< MA-S < 3
3< MA-S < 4	.0	.0	.0	.0	.3	.0	.2	.2	3< MA-S < 4
4< MA-S < 5	.0	.0	.0	.0	.0	.1	.0	.0	4< MA-S < 5
5< MA-S < 6	.0	.0	.0	.0	.0	.0	.0	.0	5< MA-S < 6
6< MA-S < 7	.0	.0	.0	.0	.0	.0	.0	.0	6< MA-S < 7
7< MA-S < 8	.0	.0	.0	.0	.0	.0	.0	.0	7< MA-S < 8
8< MA-S < 9	.0	.0	.0	.0	.0	.0	.0	.0	8< MA-S < 9
9< MA-S < 10	.0	.0	.0	.0	.0	.0	.0	.0	9< MA-S < 10
10< MA-S	.0	.0	.0	.0	.0	.0	.0	.0	10< MA-S
MEAN:	-1.5	-1.5	-1.3	-1.3	-1.2	-1.3	-1.1	-1.2	MEAN
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

Figure 15 Modified air-sea temperature difference.

MARSDEN SQUARE: 1

MODIFIED AIR-SEA TEMPERATURE (C)

REVISION: 6.3

MAIR-SEA TEMP DEG C	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	MAIR-SEA TEMP DEG C
MA-S <-10	.0	.0	.0	.0	.0	.0	.0	.0	MA-S <-10
-10< MA-S < -9	.0	.0	.0	.0	.0	.0	.0	.0	-10< MA-S < -9
-9< MA-S < -8	.0	.0	.0	.0	.0	.0	.0	.0	-9< MA-S < -8
-8< MA-S < -7	.0	.0	.0	.0	.0	.0	.0	.0	-8< MA-S < -7
-7< MA-S < -6	.0	.0	.1	.0	.0	.1	.0	.1	-7< MA-S < -6
-6< MA-S < -5	.2	.4	.1	.2	.1	.1	.0	.2	-6< MA-S < -5
-5< MA-S < -4	.1	.3	.3	.4	.3	.4	.4	.6	-5< MA-S < -4
-4< MA-S < -3	1.9	2.5	1.3	2.2	1.3	2.2	1.2	2.4	-4< MA-S < -3
-3< MA-S < -2	3.8	5.7	4.0	6.6	4.5	7.7	4.7	8.8	-3< MA-S < -2
-2< MA-S < -1	13.5	18.8	12.6	25.0	14.5	28.1	15.0	26.2	-2< MA-S < -1
-1< MA-S < 0	75.0	64.7	79.4	62.3	78.4	60.1	77.7	61.2	-1< MA-S < 0
0< MA-S < 1	3.8	5.4	1.3	2.5	.7	1.3	.7	.4	0< MA-S < 1
1< MA-S < 2	.9	1.6	.5	.6	.1	.1	.2	.0	1< MA-S < 2
2< MA-S < 3	.6	.2	.3	.1	.1	.1	.2	.1	2< MA-S < 3
3< MA-S < 4	.1	.1	.1	.1	.0	.0	.1	.1	3< MA-S < 4
4< MA-S < 5	.0	.1	.1	.1	.0	.0	.0	.0	4< MA-S < 5
5< MA-S < 6	.0	.0	.0	.0	.0	.0	.0	.0	5< MA-S < 6
6< MA-S < 7	.0	.0	.0	.0	.0	.0	.0	.0	6< MA-S < 7
7< MA-S < 8	.0	.0	.0	.1	.0	.0	.0	.0	7< MA-S < 8
8< MA-S < 9	.0	.0	.0	.0	.0	.0	.0	.0	8< MA-S < 9
9< MA-S < 10	.0	.0	.0	.0	.0	.0	.0	.0	9< MA-S < 10
10< MA-S	.0	.0	.0	.0	.0	.0	.0	.0	10< MA-S
MEAN:	-1.1	-1.1	-1.1	-1.2	-1.2	-1.3	-1.2	-1.3	MEAN
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

Figure 16 Modified air sea temperature difference

MARSDEN SQUARE: 1 RAIN RATE (MM/HR*100) REVISION: 6.3
POR: 7001-8412

RAIN RATE	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	RAIN RATE
RAIN < 1	96.4	96.0	96.8	96.3	96.4	95.8	93.5	95.8	RAIN < 1
1< RAIN < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< RAIN < 26
26< RAIN < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< RAIN < 51
51< RAIN < 76	.0	.0	.0	.0	1.5	1.2	1.7	1.2	51< RAIN < 76
76< RAIN <101	.0	.0	.0	.1	.0	.0	.6	.0	76< RAIN <101
101< RAIN <126	.0	.0	1.2	1.7	.4	.5	.0	.0	101< RAIN <126
126< RAIN <151	.4	.7	.0	.0	.0	.1	.9	.2	126< RAIN <151
151< RAIN <176	.6	1.2	.0	.0	.1	.0	.2	.0	151< RAIN <176
176< RAIN <201	.1	.0	.0	.1	.6	.8	.0	.0	176< RAIN <201
201< RAIN <226	.0	.0	.4	.2	.1	.0	.6	.6	201< RAIN <226
226< RAIN <251	.0	.0	.0	.0	.2	.7	.3	.5	226< RAIN <251
251< RAIN <276	.2	.3	.0	.0	.3	.2	.1	.0	251< RAIN <276
276< RAIN <301	.7	.6	.2	.1	.0	.0	.6	.3	276< RAIN <301
301< RAIN <326	.2	.1	.5	.2	.0	.0	.4	.4	301< RAIN <326
326< RAIN <351	.0	.0	.2	.5	.1	.1	.1	.0	326< RAIN <351
351< RAIN <376	.0	.0	.1	.0	.0	.1	.0	.0	351< RAIN <376
376< RAIN <401	.1	.0	.1	.1	.0	.0	.0	.0	376< RAIN <401
401< RAIN <426	.2	.0	.1	.1	.0	.0	.2	.0	401< RAIN <426
426< RAIN <451	.2	.1	.1	.2	.2	.1	.2	.0	426< RAIN <451
451< RAIN <476	.1	.1	.1	.2	.1	.1	.0	.2	451< RAIN <476
476< RAIN <501	.1	.1	.0	.0	.0	.0	.0	.0	476< RAIN <501
501< RAIN	.8	.7	.2	.3	.3	.3	.5	.9	501< RAIN
MEAN:	14.2	13.0	8.7	10.2	6.7	8.2	14.2	11.5	MEAN
VALID OBS:	1672	1739	1497	1617	1712	1443	2229	1055	VALID OBS

Figure 17. Rain rate.

MARSDEN SQUARE: 1 RAIN RATE (MM/HR*100) REVISION: 6.3
POR: 7001-8412

RAIN RATE	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	RAIN RATE
RAIN < 1	89.2	92.1	92.8	93.6	96.3	97.2	95.8	96.6	RAIN < 1
1< RAIN < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< RAIN < 26
26< RAIN < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< RAIN < 51
51< RAIN < 76	3.4	3.3	.0	.0	.1	.2	.1	.0	51< RAIN < 76
76< RAIN <101	.3	.0	.0	.1	1.2	.4	1.5	1.7	76< RAIN <101
101< RAIN <126	.0	.0	1.8	1.7	.8	.4	.4	.8	101< RAIN <126
126< RAIN <151	1.6	.9	1.1	1.4	.1	.0	.0	.0	126< RAIN <151
151< RAIN <176	.0	.0	.0	.0	.0	.0	.3	.2	151< RAIN <176
176< RAIN <201	.2	.1	.0	.1	.1	.1	.1	.1	176< RAIN <201
201< RAIN <226	2.5	1.7	.3	.1	.0	.1	.0	.0	201< RAIN <226
226< RAIN <251	.1	.1	.3	.3	.0	.1	.2	.0	226< RAIN <251
251< RAIN <276	.1	.1	.4	.1	.2	.3	.7	.2	251< RAIN <276
276< RAIN <301	.3	.4	.2	.0	.1	.1	.4	.3	276< RAIN <301
301< RAIN <326	.5	.3	.3	.1	.3	.2	.2	.1	301< RAIN <326
326< RAIN <351	.0	.0	.4	.4	.1	.2	.0	.0	326< RAIN <351
351< RAIN <376	.0	.0	.3	.4	.0	.0	.1	.0	351< RAIN <376
376< RAIN <401	.1	.0	.5	.3	.1	.2	.0	.0	376< RAIN <401
401< RAIN <426	.4	.2	.2	.2	.1	.0	.1	.0	401< RAIN <426
426< RAIN <451	.2	.1	.1	.2	.0	.0	.0	.0	426< RAIN <451
451< RAIN <476	.0	.0	.2	.0	.0	.1	.0	.0	451< RAIN <476
476< RAIN <501	.1	.0	.1	.3	.0	.0	.0	.0	476< RAIN <501
501< RAIN	.8	.6	1.0	.8	.4	.5	.1	.0	501< RAIN
MEAN:	22.0	15.2	21.4	18.2	8.5	7.9	8.5	4.5	MEAN
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

Figure 18. Rain rate.

MARSDEN SQUARE: 1 RAIN RATE (MM/HR*100) REVISION: 6.3
POR:7001-8412

RAIN RATE	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	RAIN RATE
RAIN < 1	94.8	96.2	94.9	95.2	95.6	96.3	96.5	96.8	RAIN < 1
1< RAIN < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< RAIN < 26
26< RAIN < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< RAIN < 51
51< RAIN < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< RAIN < 76
76< RAIN <101	.0	.0	.0	.0	.0	.0	.1	.1	76< RAIN <101
101< RAIN <126	1.8	1.6	2.0	2.8	2.2	1.4	1.2	1.4	101< RAIN <126
126< RAIN <151	.7	.4	.1	.0	.0	.0	.0	.0	126< RAIN <151
151< RAIN <176	.0	.0	.0	.0	.0	.0	.0	.0	151< RAIN <176
176< RAIN <201	.0	.0	.1	.0	.1	.0	.1	.0	176< RAIN <201
201< RAIN <226	.2	.2	.1	.2	.6	.3	.5	.2	201< RAIN <226
226< RAIN <251	.3	.1	.1	.0	.1	.1	.1	.0	226< RAIN <251
251< RAIN <276	.0	.0	.0	.0	.0	.0	.0	.0	251< RAIN <276
276< RAIN <301	.0	.0	.0	.1	.0	.0	.1	.0	276< RAIN <301
301< RAIN <326	.1	.0	.2	.3	.1	.1	.4	.1	301< RAIN <326
326< RAIN <351	.6	.4	1.2	.4	.7	.6	.5	.5	326< RAIN <351
351< RAIN <376	.5	.5	.4	.4	.2	.3	.0	.0	351< RAIN <376
376< RAIN <401	.2	.1	.1	.1	.0	.0	.0	.1	376< RAIN <401
401< RAIN <426	.0	.0	.1	.0	.0	.0	.0	.1	401< RAIN <426
426< RAIN <451	.1	.0	.2	.0	.1	.3	.0	.2	426< RAIN <451
451< RAIN <476	.0	.0	.0	.1	.0	.1	.0	.1	451< RAIN <476
476< RAIN <501	.2	.0	.0	.1	.0	.2	.3	.1	476< RAIN <501
501< RAIN	.5	.4	.6	.5	.3	.4	.4	.5	501< RAIN
MEAN:	14.0	10.5	14.5	11.4	10.3	11.2	9.9	10.1	MEAN
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

Figure 19. Rain rate.

MARSDEN SQUARE: 1 GAS ATTN: 35 GHZ (DB/KM*1000) REVISION: 6.3
POR: 7001-8412

GAS ATTN 35 GHZ	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	GAS ATTN 35 GHZ
G 35 < 1	.0	.0	.0	.0	.0	.0	.0	.0	G 35 < 1
1< G 35 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< G 35 < 26
26< G 35 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< G 35 < 51
51< G 35 < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< G 35 < 76
76< G 35 <101	.0	.0	.0	.0	.0	.0	.0	.0	76< G 35 <101
101< G 35 <126	.0	.0	.0	.0	.0	.0	.0	.0	101< G 35 <126
126< G 35 <151	.1	.0	.0	.0	.0	.0	.0	.0	126< G 35 <151
151< G 35 <176	.4	.1	.0	.0	.1	.0	.0	.0	151< G 35 <176
176< G 35 <201	.6	.7	.1	.2	.3	.1	.3	.2	176< G 35 <201
201< G 35 <226	2.8	2.4	1.4	1.7	.9	1.2	1.3	.9	201< G 35 <226
226< G 35 <251	26.4	26.7	20.7	19.7	21.3	19.4	21.9	19.8	226< G 35 <251
251< G 35 <276	53.9	55.2	58.7	61.6	54.7	57.2	54.7	57.2	251< G 35 <276
276< G 35 <301	14.1	13.6	16.8	15.3	18.9	19.5	17.5	19.1	276< G 35 <301
301< G 35 <326	1.6	1.3	1.9	1.5	3.4	2.5	3.7	2.9	301< G 35 <326
326< G 35 <351	.1	.0	.3	.0	.4	.0	.5	.0	326< G 35 <351
351< G 35 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< G 35 <376
376< G 35 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< G 35 <401
401< G 35 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< G 35 <426
426< G 35 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< G 35 <451
451< G 35 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< G 35 <476
476< G 35 <501	.0	.0	.0	.0	.0	.0	.0	.0	476< G 35 <501
501< G 35	.0	.0	.0	.0	.0	.0	.0	.0	501< G 35
MEAN:	258.8	259.3	262.8	261.5	264.1	263.8	263.5	264.1	MEAN
VALID OBS:	1672	1739	1497	1617	1712	1443	2229	1055	VALID OBS

Figure 20. 35 GHz attenuation rate (gaseous).

MARSDEN SQUARE: 1 GAS ATIN: 35 GHZ (DB/KM*1000) REVISION: 6.3
FOR:7001-8412

GAS ATIN 35 GHZ	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	GAS ATIN 35 GHZ
G 35 < 1	.0	.0	.0	.0	.0	.0	.0	.0	G 35 < 1
1< G 35 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< G 35 < 26
26< G 35 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< G 35 < 51
51< G 35 < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< G 35 < 76
76< G 35 <101	.0	.0	.0	.0	.0	.0	.0	.0	76< G 35 <101
101< G 35 <126	.0	.0	.0	.0	.0	.0	.0	.0	101< G 35 <126
126< G 35 <151	.0	.0	.0	.0	.0	.0	.0	.0	126< G 35 <151
151< G 35 <176	.1	.0	.0	.0	.1	.1	.1	.0	151< G 35 <176
176< G 35 <201	.1	.2	.9	.8	3.0	2.6	2.9	2.6	176< G 35 <201
201< G 35 <226	3.1	2.4	14.1	14.0	41.1	41.4	35.6	37.1	201< G 35 <226
226< G 35 <251	31.8	29.1	57.3	57.8	47.5	47.2	52.3	52.2	226< G 35 <251
251< G 35 <276	54.6	60.5	25.2	25.4	7.2	8.3	8.6	7.9	251< G 35 <276
276< G 35 <301	8.9	7.2	2.2	1.9	.9	.3	.6	.2	276< G 35 <301
301< G 35 <326	1.2	.6	.4	.2	.1	.1	.0	.0	301< G 35 <326
326< G 35 <351	.2	.0	.0	.0	.0	.0	.0	.0	326< G 35 <351
351< G 35 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< G 35 <376
376< G 35 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< G 35 <401
401< G 35 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< G 35 <426
426< G 35 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< G 35 <451
451< G 35 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< G 35 <476
476< G 35 <501	.0	.0	.0	.0	.0	.0	.0	.0	476< G 35 <501
501< G 35	.0	.0	.0	.0	.0	.0	.0	.0	501< G 35
MEAN:	256.7	256.7	242.6	242.4	229.4	229.7	230.6	230.0	MEAN
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

Figure 21. 35 GHz attenuation rate (gaseous).

MARSDEN SQUARE: 1 GAS ATTN: 35 GHZ (DB/KM*1000) REVISION: 6.3
FOR: 7001-8412

GAS ATTN 35 GHZ	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	GAS ATTN 35 GHZ
G 35 < 1	.0	.0	.0	.0	.0	.0	.0	.0	G 35 < 1
1< G 35 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< G 35 < 26
26< G 35 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< G 35 < 51
51< G 35 < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< G 35 < 76
76< G 35 <101	.0	.0	.0	.0	.0	.0	.0	.0	76< G 35 <101
101< G 35 <126	.0	.0	.0	.0	.0	.0	.0	.0	101< G 35 <126
126< G 35 <151	.0	.0	.0	.0	.0	.0	.0	.0	126< G 35 <151
151< G 35 <176	.0	.0	.0	.1	.0	.0	.3	.2	151< G 35 <176
176< G 35 <201	1.1	.6	.7	.6	.2	.0	.7	.8	176< G 35 <201
201< G 35 <226	21.2	18.6	10.0	10.2	2.7	2.5	4.2	2.9	201< G 35 <226
226< G 35 <251	61.3	64.1	57.3	58.9	47.7	41.4	41.5	34.6	226< G 35 <251
251< G 35 <276	15.8	16.2	28.2	28.7	42.0	48.7	44.0	53.4	251< G 35 <276
276< G 35 <301	.5	.4	3.4	1.6	6.8	6.8	7.4	7.0	276< G 35 <301
301< G 35 <326	.0	.1	.4	.1	.6	.5	1.9	1.0	301< G 35 <326
326< G 35 <351	.0	.0	.0	.0	.0	.0	.1	.0	326< G 35 <351
351< G 35 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< G 35 <376
376< G 35 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< G 35 <401
401< G 35 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< G 35 <426
426< G 35 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< G 35 <451
451< G 35 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< G 35 <476
476< G 35 <501	.0	.0	.0	.0	.0	.0	.0	.0	476< G 35 <501
501< G 35	.0	.0	.0	.0	.0	.0	.0	.0	501< G 35
MEAN:	237.1	237.8	245.0	244.1	252.5	253.6	253.4	254.4	MEAN
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

Figure 22. 35 GHz attenuation rate (gaseous).

MARSDEN SQUARE: 1 GAS ATTN: 94 GHZ (DB/KM*100) REVISION: 6.3
FOR:7001-8412

GAS ATTN 94 GHZ	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	GAS ATTN 94 GHZ
G 94 < 1	.0	.0	.0	.0	.0	.0	.0	.0	G 94 < 1
1< G 94 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< G 94 < 26
26< G 94 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< G 94 < 51
51< G 94 < 76	.4	.1	.0	.0	.0	.0	.0	.0	51< G 94 < 76
76< G 94 <101	1.9	1.8	.7	1.0	.6	.6	.6	.5	76< G 94 <101
101< G 94 <126	62.5	61.8	59.2	58.9	56.3	54.8	58.0	55.1	101< G 94 <126
126< G 94 <151	34.9	36.3	39.3	39.8	41.6	44.1	39.8	43.8	126< G 94 <151
151< G 94 <176	.3	.1	.8	.3	1.5	.6	1.5	.7	151< G 94 <176
176< G 94 <201	.0	.0	.0	.0	.0	.0	.0	.0	176< G 94 <201
201< G 94 <226	.0	.0	.0	.0	.0	.0	.0	.0	201< G 94 <226
226< G 94 <251	.0	.0	.0	.0	.0	.0	.0	.0	226< G 94 <251
251< G 94 <276	.0	.0	.0	.0	.0	.0	.0	.0	251< G 94 <276
276< G 94 <301	.0	.0	.0	.0	.0	.0	.0	.0	276< G 94 <301
301< G 94 <326	.0	.0	.0	.0	.0	.0	.0	.0	301< G 94 <326
326< G 94 <351	.0	.0	.0	.0	.0	.0	.0	.0	326< G 94 <351
351< G 94 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< G 94 <376
376< G 94 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< G 94 <401
401< G 94 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< G 94 <426
426< G 94 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< G 94 <451
451< G 94 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< G 94 <476
476< G 94 <501	.0	.0	.0	.0	.0	.0	.0	.0	476< G 94 <501
501< G 94	.0	.0	.0	.0	.0	.0	.0	.0	501< G 94
MEAN:	122.5	122.8	124.6	124.0	125.2	125.1	124.9	125.3	MEAN
VALID OBS:	1672	1739	1497	1617	1712	1443	2229	1055	VALID OBS

Figure 23 94 GHz attenuation rate (gaseous).

MARSDEN SQUARE: 1 GAS ATTN: 94 GHZ (DB/KM*100) REVISION: 6.3

FOR:7001-8412

GAS ATTN 94 GHZ	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	GAS ATTN 94 GHZ
G 94 < 1	.0	.0	.0	.0	.0	.0	.0	.0	G 94 < 1
1< G 94 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< G 94 < 26
26< G 94 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< G 94 < 51
51< G 94 < 76	.1	.0	.0	.0	.1	.0	.0	.0	51< G 94 < 76
76< G 94 <101	1.1	1.3	6.3	5.8	22.0	22.1	19.6	20.9	76< G 94 <101
101< G 94 <126	71.7	72.6	86.6	88.4	75.4	75.8	78.2	77.6	101< G 94 <126
126< G 94 <151	26.7	26.1	7.0	5.8	2.4	2.0	2.1	1.5	126< G 94 <151
151< G 94 <176	.4	.1	.1	.0	.1	.1	.0	.0	151< G 94 <176
176< G 94 <201	.0	.0	.0	.0	.0	.0	.0	.0	176< G 94 <201
201< G 94 <226	.0	.0	.0	.0	.0	.0	.0	.0	201< G 94 <226
226< G 94 <251	.0	.0	.0	.0	.0	.0	.0	.0	226< G 94 <251
251< G 94 <276	.0	.0	.0	.0	.0	.0	.0	.0	251< G 94 <276
276< G 94 <301	.0	.0	.0	.0	.0	.0	.0	.0	276< G 94 <301
301< G 94 <326	.0	.0	.0	.0	.0	.0	.0	.0	301< G 94 <326
326< G 94 <351	.0	.0	.0	.0	.0	.0	.0	.0	326< G 94 <351
351< G 94 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< G 94 <376
376< G 94 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< G 94 <401
401< G 94 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< G 94 <426
426< G 94 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< G 94 <451
451< G 94 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< G 94 <476
476< G 94 <501	.0	.0	.0	.0	.0	.0	.0	.0	476< G 94 <501
501< G 94	.0	.0	.0	.0	.0	.0	.0	.0	501< G 94
MEAN:	121.4	121.5	114.2	114.1	107.3	107.5	107.9	107.6	MEAN
VALID OBS:	2671	1392	2456	1246	2302	1126	2542	1275	VALID OBS

Figure 24. 94 GHz attenuation rate (gaseous).

MARSDEN SQUARE: 1 GAS ATTN: 94 GHZ (DB/KM*100) REVISION: 6.3

LAT: 1401-1412

GAS ATTN 94 GHZ	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	GAS ATTN 94 GHZ
G 94 < 1	.0	.0	.0	.0	.0	.0	.0	.0	G 94 < 1
1< G 94 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< G 94 < 26
26< G 94 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< G 94 < 51
51< G 94 < 76	.0	.0	.0	.0	.0	.0	.2	.0	51< G 94 < 76
76< G 94 <101	9.9	9.3	3.2	3.9	1.1	.7	2.2	2.4	76< G 94 <101
101< G 94 <126	87.7	88.7	87.5	89.3	81.0	81.3	76.1	76.0	101< G 94 <126
126< G 94 <151	2.4	1.9	9.2	6.8	17.7	18.0	20.6	21.6	126< G 94 <151
151< G 94 <176	.0	.0	.1	.0	.1	.0	.9	.1	151< G 94 <176
176< G 94 <201	.0	.0	.0	.0	.0	.0	.0	.0	176< G 94 <201
201< G 94 <226	.0	.0	.0	.0	.0	.0	.0	.0	201< G 94 <226
226< G 94 <251	.0	.0	.0	.0	.0	.0	.0	.0	226< G 94 <251
251< G 94 <276	.0	.0	.0	.0	.0	.0	.0	.0	251< G 94 <276
276< G 94 <301	.0	.0	.0	.0	.0	.0	.0	.0	276< G 94 <301
301< G 94 <326	.0	.0	.0	.0	.0	.0	.0	.0	301< G 94 <326
326< G 94 <351	.0	.0	.0	.0	.0	.0	.0	.0	326< G 94 <351
351< G 94 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< G 94 <376
376< G 94 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< G 94 <401
401< G 94 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< G 94 <426
426< G 94 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< G 94 <451
451< G 94 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< G 94 <476
476< G 94 <501	.0	.0	.0	.0	.0	.0	.0	.0	476< G 94 <501
501< G 94	.0	.0	.0	.0	.0	.0	.0	.0	501< G 94
MEAN:	111.3	111.7	115.4	115.0	119.3	119.9	119.8	120.3	MEAN
VALID OBS:	2090	1412	1556	1942	1496	1871	1329	1606	VALID OBS

Figure 25 94 GHz attenuation rate (gaseous).

MARSDEN SQUARE: 1
FOR: 7001-8412

TOT ATTN: 35 GHZ (DB/KM*1000)

REVISION: 6.3

TOT ATTN 35 GHZ	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	TOT ATTN 35 GHZ
T 35 < 1	.0	.0	.0	.0	.0	.0	.0	.0	T 35 < 1
1< T 35 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< T 35 < 26
26< T 35 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< T 35 < 51
51< T 35 < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< T 35 < 76
76< T 35 <101	.0	.0	.0	.0	.0	.0	.0	.0	76< T 35 <101
101< T 35 <126	.0	.0	.0	.0	.0	.0	.0	.0	101< T 35 <126
126< T 35 <151	.1	.0	.0	.0	.0	.0	.0	.0	126< T 35 <151
151< T 35 <176	.3	.1	.0	.0	.1	.0	.0	.0	151< T 35 <176
176< T 35 <201	.7	.7	.1	.2	.3	.1	.3	.2	176< T 35 <201
201< T 35 <226	2.6	2.1	1.3	1.6	.8	1.0	1.3	.8	201< T 35 <226
226< T 35 <251	24.8	24.9	19.7	18.6	19.8	17.9	20.1	19.0	226< T 35 <251
251< T 35 <276	52.2	53.9	56.9	59.2	52.9	54.8	50.7	55.0	251< T 35 <276
276< T 35 <301	14.1	13.0	16.5	15.2	18.8	19.6	17.0	18.2	276< T 35 <301
301< T 35 <326	1.5	1.2	1.9	1.4	3.5	2.4	3.7	2.7	301< T 35 <326
326< T 35 <351	.1	.0	.3	.0	.4	.0	.5	.0	326< T 35 <351
351< T 35 <376	.0	.0	.0	.0	.1	.1	.0	.0	351< T 35 <376
376< T 35 <401	.0	.0	.0	.0	.4	.3	.0	.0	376< T 35 <401
401< T 35 <426	.0	.0	.0	.0	.9	.6	.4	.3	401< T 35 <426
426< T 35 <451	.0	.0	.0	.0	.1	.1	1.2	.3	426< T 35 <451
451< T 35 <476	.0	.0	.0	.0	.0	.1	.5	.7	451< T 35 <476
476< T 35 <501	.0	.0	.0	.1	.0	.0	.1	.0	476< T 35 <501
501< T 35	3.7	4.0	3.2	3.7	2.1	3.0	4.2	2.9	501< T 35
MEAN:	299.1	299.9	286.9	290.1	282.4	286.5	302.8	296.4	MEAN
VALID OBS:	1668	1355	1493	1616	1711	1441	2224	1053	VALID OBS

Figure 26. 35 GHz attenuation data output

MARSDEN SQUARE: 1 TOT ATTN: 35 GHZ (DB/KM*1000) REVISION: 6.3
FOR: 7001-2412

TOT ATTN 35 GHZ	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	TOT ATTN 35 GHZ
T 35 < 1	.0	.0	.0	.0	.0	.0	.0	.0	T 35 < 1
1< T 35 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< T 35 < 26
26< T 35 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< T 35 < 51
51< T 35 < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< T 35 < 76
76< T 35 <101	.0	.0	.0	.0	.0	.0	.0	.0	76< T 35 <101
101< T 35 <126	.0	.0	.0	.0	.0	.0	.0	.0	101< T 35 <126
126< T 35 <151	.0	.0	.0	.0	.0	.0	.0	.0	126< T 35 <151
151< T 35 <176	.1	.0	.0	.0	.1	.1	.1	.0	151< T 35 <176
176< T 35 <201	.1	.2	.9	.5	3.0	2.6	2.9	2.5	176< T 35 <201
201< T 35 <226	2.9	2.4	13.9	13.4	40.6	41.4	35.3	36.4	201< T 35 <226
226< T 35 <251	28.9	27.3	53.8	55.0	44.9	45.1	49.1	50.2	226< T 35 <251
251< T 35 <276	47.5	55.1	21.9	22.9	6.7	7.7	7.8	7.3	251< T 35 <276
276< T 35 <301	8.3	6.6	1.9	1.6	.9	.3	.6	.2	276< T 35 <301
301< T 35 <326	1.1	.5	.4	.2	.1	.1	.0	.1	301< T 35 <326
326< T 35 <351	.2	.0	.0	.0	.0	.0	.0	.0	326< T 35 <351
351< T 35 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< T 35 <376
376< T 35 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< T 35 <401
401< T 35 <426	1.0	.9	.0	.0	.2	.2	.1	.1	401< T 35 <426
426< T 35 <451	1.8	1.7	.0	.0	.1	.2	.3	.2	426< T 35 <451
451< T 35 <476	.8	.6	.0	.1	.6	.0	.6	.9	451< T 35 <476
476< T 35 <501	.1	.1	.0	.0	.5	.4	.4	.8	476< T 35 <501
501< T 35	7.1	4.6	7.2	6.4	2.3	2.0	2.7	1.5	501< T 35
MEAN:	317.3	298.6	302.3	293.5	252.9	251.8	254.1	242.1	MEAN
VALID OBS:	2665	1390	2449	1240	2300	1124	2533	1272	VALID OBS

Figure 27. 35 GHz attenuation rate (total).

MARSDEN SQUARE: 1 TOT ATTN: 35 GHZ (DB/KM*1000) REVISION: 6.3
FOR: 7001-8412

TOT ATTN 35 GHZ	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	TOT ATTN 35 GHZ
T 35 < 1	.0	.0	.0	.0	.0	.0	.0	.0	T 35 < 1
1< T 35 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< T 35 < 26
26< T 35 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< T 35 < 51
51< T 35 < 76	.0	.0	.0	.0	.0	.0	.0	.0	51< T 35 < 76
76< T 35 <101	.0	.0	.0	.0	.0	.0	.0	.0	76< T 35 <101
101< T 35 <126	.0	.0	.0	.0	.0	.0	.0	.0	101< T 35 <126
126< T 35 <151	.0	.0	.0	.0	.0	.0	.0	.0	126< T 35 <151
151< T 35 <176	.0	.0	.0	.1	.0	.0	.3	.2	151< T 35 <176
176< T 35 <201	1.1	.6	.7	.6	.2	.0	.6	.8	176< T 35 <201
201< T 35 <226	20.9	18.6	9.8	10.0	2.7	2.5	3.7	2.8	201< T 35 <226
226< T 35 <251	56.9	62.0	54.5	56.1	45.5	40.2	40.1	33.2	226< T 35 <251
251< T 35 <276	15.1	14.7	26.1	26.8	40.0	46.3	42.2	52.0	251< T 35 <276
276< T 35 <301	.6	.4	3.3	1.6	6.6	6.8	7.4	6.7	276< T 35 <301
301< T 35 <326	.0	.1	.5	.1	.6	.5	1.9	1.0	301< T 35 <326
326< T 35 <351	.0	.0	.0	.0	.0	.0	.1	.0	326< T 35 <351
351< T 35 <376	.0	.0	.0	.0	.0	.0	.0	.0	351< T 35 <376
376< T 35 <401	.0	.0	.0	.0	.0	.0	.0	.0	376< T 35 <401
401< T 35 <426	.0	.0	.0	.0	.0	.0	.0	.0	401< T 35 <426
426< T 35 <451	.0	.0	.0	.0	.0	.0	.0	.0	426< T 35 <451
451< T 35 <476	.0	.0	.0	.0	.0	.0	.0	.0	451< T 35 <476
476< T 35 <501	.0	.0	.1	.1	.0	.0	.0	.2	476< T 35 <501
501< T 35	5.3	3.7	5.1	4.7	4.4	3.8	3.6	3.1	501< T 35
MEAN:	276.3	267.0	285.6	275.9	279.6	285.4	281.5	283.1	MEAN
VALID OBS:	2086	1407	1553	1939	1494	1870	1318	1588	VALID OBS

Figure 28 35 GHz attenuation rate (total)

MARSDEN SQUARE: 1 TOT ATTN: 94 GHZ (DB/KM*100) REVISION: 6.3
FOR:7001-8412

TOT ATTN 94 GHZ	JANUARY DAY %	JANUARY NIGHT %	FEBRUARY DAY %	FEBRUARY NIGHT %	MARCH DAY %	MARCH NIGHT %	APRIL DAY %	APRIL NIGHT %	TOT ATTN 94 GHZ
T 94 < 1	.0	.0	.0	.0	.0	.0	.0	.0	T 94 < 1
1< T 94 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< T 94 < 26
26< T 94 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< T 94 < 51
51< T 94 < 76	.4	.1	.0	.0	.0	.0	.0	.0	51< T 94 < 76
76< T 94 <101	1.6	1.8	.7	.9	.5	.6	.6	.5	76< T 94 <101
101< T 94 <126	59.5	59.1	56.6	56.2	53.4	51.5	53.1	53.5	101< T 94 <126
126< T 94 <151	34.6	35.0	38.7	38.8	40.9	43.1	38.3	41.4	126< T 94 <151
151< T 94 <176	.3	.1	.8	.3	1.5	.6	1.4	.5	151< T 94 <176
176< T 94 <201	.0	.0	.0	.0	.2	.3	.0	.0	176< T 94 <201
201< T 94 <226	.0	.0	.0	.0	1.3	.8	1.3	.3	201< T 94 <226
226< T 94 <251	.0	.0	.0	.2	.0	.1	1.0	.9	226< T 94 <251
251< T 94 <276	.1	.0	.7	1.2	.4	.2	.0	.0	251< T 94 <276
276< T 94 <301	.1	.4	.5	.3	.0	.3	.4	.2	276< T 94 <301
301< T 94 <326	.5	.9	.1	.1	.0	.1	.7	.0	301< T 94 <326
326< T 94 <351	.4	.7	.0	.1	.2	.6	.0	.0	326< T 94 <351
351< T 94 <376	.0	.0	.4	.1	.4	.2	.2	.1	351< T 94 <376
376< T 94 <401	.0	.0	.0	.1	.1	.4	.5	.7	376< T 94 <401
401< T 94 <426	.2	.4	.0	.0	.3	.5	.3	.4	401< T 94 <426
426< T 94 <451	.8	.5	.3	.1	.1	.0	.4	.2	426< T 94 <451
451< T 94 <476	.1	.1	.3	.4	.0	.1	.6	.3	451< T 94 <476
476< T 94 <501	.0	.0	.3	.4	.1	.1	.1	.1	476< T 94 <501
501< T 94	1.4	1.0	.7	.9	.5	.6	1.1	1.0	501< T 94
MEAN:	136.8	136.1	134.0	134.9	132.9	134.7	140.8	137.6	MEAN
VALID OBS:	1668	1735	1493	1616	1711	1441	2224	1053	VALID OBS

Figure 29 94 GHz attenuation rate (total).

MARSHEN SQUARE: 1
FOR: 7001-8412

TOT ATTN: 94 GHZ (DB/KM*100)

REVISION: 6.3

TOT ATTN 94 GHZ	MAY DAY %	MAY NIGHT %	JUNE DAY %	JUNE NIGHT %	JULY DAY %	JULY NIGHT %	AUGUST DAY %	AUGUST NIGHT %	TOT ATTN 94 GHZ
T 94 < 1	.0	.0	.0	.0	.0	.0	.0	.0	T 94 < 1
1< T 94 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< T 94 < 26
26< T 94 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< T 94 < 51
51< T 94 < 76	.1	.0	.0	.0	.1	.0	.0	.0	51< T 94 < 76
76< T 94 <101	1.0	1.3	6.2	5.2	21.9	21.9	19.6	20.7	76< T 94 <101
101< T 94 <126	64.1	67.5	80.2	83.4	71.8	73.2	74.1	74.8	101< T 94 <126
126< T 94 <151	23.5	23.2	6.2	5.0	2.4	2.0	2.0	1.1	126< T 94 <151
151< T 94 <176	.4	.1	.1	.0	.1	.1	.0	.1	151< T 94 <176
176< T 94 <201	.0	.0	.0	.0	.0	.0	.0	.0	176< T 94 <201
201< T 94 <226	2.1	2.2	.0	.0	.3	.3	.2	.2	201< T 94 <226
226< T 94 <251	1.6	1.1	.0	.1	1.3	.5	1.3	1.7	226< T 94 <251
251< T 94 <276	.1	.0	1.2	1.2	.4	.2	.4	.6	251< T 94 <276
276< T 94 <301	1.1	.5	1.5	1.7	.2	.0	.0	.0	276< T 94 <301
301< T 94 <326	.6	.4	.3	.2	.0	.0	.2	.2	301< T 94 <326
326< T 94 <351	.1	.1	.1	.1	.1	.1	.2	.1	326< T 94 <351
351< T 94 <376	1.5	.4	.2	.1	.0	.1	.0	.0	351< T 94 <376
376< T 94 <401	1.3	1.2	.3	.2	.0	.1	.2	.0	376< T 94 <401
401< T 94 <426	.2	.1	.4	.2	.2	.2	.8	.2	401< T 94 <426
426< T 94 <451	.3	.4	.3	.0	.2	.3	.4	.4	426< T 94 <451
451< T 94 <476	.6	.2	.2	.4	.3	.3	.1	.0	451< T 94 <476
476< T 94 <501	.0	.2	.4	.3	.0	.0	.0	.0	476< T 94 <501
501< T 94	1.6	1.0	2.2	1.9	.7	.8	.4	.0	501< T 94
MEAN:	146.5	139.0	136.8	133.5	116.6	115.8	117.8	113.4	MEAN
VALID OBS:	2665	1390	2449	1240	2300	1124	2533	1272	VALID OBS

Figure 30. 94 GHz attenuation rate (total)

[illegible]

TOT ATTN: 94 GHZ (DB/KM*100)

REVISION: 6.3

TOT ATTN 94 GHZ	SEPTEMBER DAY %	SEPTEMBER NIGHT %	OCTOBER DAY %	OCTOBER NIGHT %	NOVEMBER DAY %	NOVEMBER NIGHT %	DECEMBER DAY %	DECEMBER NIGHT %	TOT ATTN 94 GHZ
T 94 < 1	.0	.0	.0	.0	.0	.0	.0	.0	T 94 < 1
1< T 94 < 26	.0	.0	.0	.0	.0	.0	.0	.0	1< T 94 < 26
26< T 94 < 51	.0	.0	.0	.0	.0	.0	.0	.0	26< T 94 < 51
51< T 94 < 76	.0	.0	.0	.0	.0	.0	.2	.0	51< T 94 < 76
76< T 94 <101	9.7	9.4	3.1	3.8	1.1	.7	1.9	2.3	76< T 94 <101
101< T 94 <126	82.6	85.0	83.1	85.1	77.2	78.2	73.5	73.0	101< T 94 <126
126< T 94 <151	2.5	1.9	8.6	6.2	17.1	17.3	19.9	21.3	126< T 94 <151
151< T 94 <176	.0	.0	.1	.0	.1	.0	.9	.1	151< T 94 <176
176< T 94 <201	.0	.0	.0	.0	.0	.0	.0	.0	176< T 94 <201
201< T 94 <226	.0	.0	.0	.0	.0	.0	.0	.0	201< T 94 <226
226< T 94 <251	.0	.0	.1	.2	.0	.0	.1	.3	226< T 94 <251
251< T 94 <276	1.3	1.2	1.3	2.1	1.6	.9	.9	1.1	251< T 94 <276
276< T 94 <301	1.1	.6	.7	.6	.6	.5	.4	.1	276< T 94 <301
301< T 94 <326	.1	.0	.0	.0	.1	.1	.0	.0	301< T 94 <326
326< T 94 <351	.0	.0	.1	.0	.1	.0	.1	.0	326< T 94 <351
351< T 94 <376	.2	.1	.1	.2	.5	.3	.4	.1	351< T 94 <376
376< T 94 <401	.3	.2	.1	.1	.2	.1	.2	.1	376< T 94 <401
401< T 94 <426	.0	.0	.1	.0	.1	.0	.0	.0	401< T 94 <426
426< T 94 <451	.0	.0	.0	.1	.0	.1	.2	.0	426< T 94 <451
451< T 94 <476	.3	.2	.6	.4	.4	.2	.3	.2	451< T 94 <476
476< T 94 <501	.6	.4	1.2	.6	.5	.5	.5	.4	476< T 94 <501
501< T 94	1.2	.9	1.0	.8	.4	1.2	.7	.9	501< T 94
MEAN:	126.6	122.7	131.0	127.6	130.4	131.8	130.6	130.7	MEAN
VALID OBS:	2086	1407	1553	1939	1494	1870	1318	1588	VALID OBS

Figure 31. 94 GHz attenuation rate (total).

MARSDEN SQUARE: 1
FOR: 7001-8412

PAULUS DUCT HEIGHT VS WIND SPEED (M/SEC)

REVISION: 6.3

PROBABILITY*1E4: DAYTIME

DUCT HEIGHT (M)	< 0-	1-	2-	3-	4-	5-	6-	7-	WIND 8-	SPEED 9-	(M/S) 10-	11-	12-	13-	14-	15-	16-	17-	18-	19-	20>	20	DUCT HEIGHT (M)
00-02	0	6	6	13	14	16	17	11	6	2	0	0	0	0	0	0	0	0	0	0	0	0	00-02
02-04	0	90	39	12	7	10	11	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	02-04
04-06	0	198	146	67	22	21	16	12	8	2	1	0	0	0	0	0	0	0	0	0	0	0	04-06
06-08	0	102	243	205	75	59	36	27	8	3	3	1	0	0	0	0	0	0	0	0	0	0	06-08
08-10	0	8	245	338	187	180	88	42	14	11	6	2	0	0	0	0	0	0	0	0	0	0	08-10
10-12	0	1	118	468	244	300	156	84	36	17	8	0	0	0	0	0	0	0	0	0	0	0	10-12
12-14	0	0	34	315	270	423	230	138	53	25	13	6	1	0	0	0	0	0	0	0	0	0	12-14
14-16	0	0	4	143	186	422	274	221	92	34	22	5	2	2	0	0	0	0	0	0	0	0	14-16
16-18	0	0	0	34	78	318	258	264	116	64	31	12	2	2	0	0	0	0	0	0	0	0	16-18
18-20	0	0	0	6	23	141	149	216	117	81	42	16	3	2	1	0	0	0	0	0	0	0	18-20
20-22	0	0	0	0	6	42	72	139	85	58	37	14	4	4	0	0	2	0	0	0	0	0	20-22
22-24	0	0	0	0	0	15	29	89	64	44	30	16	3	3	1	0	0	0	0	0	0	0	22-24
24-26	0	0	0	0	1	5	6	23	31	13	15	5	4	4	0	0	0	0	0	0	0	0	24-26
26-28	0	0	0	0	0	1	4	10	7	8	11	5	0	1	1	1	0	0	0	0	0	0	26-28
28-30	0	0	0	0	0	1	0	5	2	2	2	3	1	0	0	0	0	0	0	0	0	0	28-30
30-32	0	0	0	0	0	0	0	0	2	2	2	0	1	0	0	0	0	0	0	0	0	0	30-32
32-34	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	32-34
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
36-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36-38
38-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38-40
>= 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>= 40
UNDF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UNDF

OBS : 23552(23552) SCALED: 23552.02 RATIO : 1.000

Figure 32. Paulus crossed with wind.

MARSDEN SQUARE: 1
FOR:7001-8412

PAULUS DUCT HEIGHT VS WIND SPEED (M/SEC)

REVISION: 6.3

PROBABILITY*1E4: NIGHT

DUCT HEIGHT (M)	< 0-	1-	2-	3-	4-	5-	6-	7-	WIND 8-	SPEED 9-	(M/S) 10-	11-	12-	13-	14-	15-	16-	17-	18-	19-	20>	20	DUCT HEIGHT (M)
00-02	0	14	10	18	15	26	14	12	4	3	0	1	0	1	0	0	0	0	0	0	0	0	00-02
02-04	0	132	60	26	12	16	11	9	6	1	0	1	0	0	0	0	0	0	0	0	0	0	02-04
04-06	0	236	182	104	37	36	21	20	6	6	1	0	0	1	0	0	0	0	0	0	0	0	04-06
06-08	0	34	279	276	113	121	68	30	8	5	2	0	0	0	0	0	0	0	0	0	0	0	06-08
08-10	0	1	189	533	240	245	122	52	19	11	5	0	0	0	1	0	0	0	0	0	0	0	08-10
10-12	0	0	56	547	394	465	229	125	54	27	5	1	1	0	1	0	0	0	0	0	0	0	10-12
12-14	0	0	3	182	257	630	342	181	77	28	20	3	0	1	1	0	0	0	0	0	0	0	12-14
14-16	0	0	2	32	84	436	337	279	122	44	20	5	2	1	0	0	0	0	0	0	0	0	14-16
16-18	0	0	1	3	13	161	169	216	125	51	27	9	1	1	0	0	0	0	0	0	0	0	16-18
18-20	0	0	0	2	4	33	72	130	79	54	32	11	2	3	0	0	1	0	0	0	0	0	18-20
20-22	0	0	0	0	1	7	19	47	57	25	25	19	1	1	0	0	0	0	0	0	0	0	20-22
22-24	0	0	0	0	1	2	6	14	16	16	14	9	1	2	0	0	0	0	0	0	0	0	22-24
24-26	0	0	0	0	0	1	1	6	7	1	3	4	2	1	0	0	0	0	0	0	0	0	24-26
26-28	0	0	0	0	0	0	1	1	3	1	2	1	0	0	0	0	0	0	0	0	0	0	26-28
28-30	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	28-30
30-32	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	30-32
32-34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32-34
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
36-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36-38
38-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38-40
>= 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>= 40
UNDF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UNDF

OBS : 17724(17724) SCALED: 17723.99 RATIO : 1.000

Figure 33 Paulus crossed with wind

MARSDEN SQUARE: 1
FOR: 7001-8412

PAULUS DUCT HEIGHT VS WIND SPEED (M/SEC)

REVISION: 6.3

DUCT HEIGHT (M)	PROBABILITY*1E4: COMBINED WIND SPEED (M/S)																					DUCT HEIGHT (M)
	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	10-	11-	12-	13-	14-	15-	16-	17-	18-	19-	20>	20	
00-02	0	9	8	15	15	21	15	12	5	3	0	0	0	0	0	0	0	0	0	0	0	0	00-02
02-04	0	108	48	18	9	13	11	8	4	2	0	0	0	0	0	0	0	0	0	0	0	0	02-04
04-06	0	214	162	83	38	28	18	15	7	3	1	0	0	0	0	0	0	0	0	0	0	0	04-06
06-08	0	73	259	236	91	86	50	28	8	4	3	0	0	0	0	0	0	0	0	0	0	0	06-08
08-10	0	5	221	432	210	208	102	47	16	11	6	1	0	0	0	0	0	0	0	0	0	0	08-10
10-12	0	0	92	502	309	371	187	101	44	21	7	1	0	0	0	0	0	0	0	0	0	0	10-12
12-14	0	0	21	258	264	512	278	156	63	27	16	5	0	0	0	0	0	0	0	0	0	0	12-14
14-16	0	0	3	99	142	428	301	246	105	38	21	5	2	1	0	0	0	0	0	0	0	0	14-16
16-18	0	0	0	21	60	261	220	243	120	59	30	11	2	2	0	0	0	0	0	0	0	0	16-18
18-20	0	0	0	4	15	95	116	179	101	69	38	14	3	3	0	0	0	0	0	0	0	0	18-20
20-22	0	0	0	0	4	27	49	100	73	44	32	16	3	3	0	0	1	0	0	0	0	0	20-22
22-24	0	0	0	0	0	9	17	40	44	32	23	13	2	3	0	0	0	0	0	0	0	0	22-24
24-26	0	0	0	0	0	3	4	15	21	8	10	5	3	3	0	0	0	0	0	0	0	0	24-26
26-28	0	0	0	0	0	0	3	6	5	5	7	3	0	1	0	0	0	0	0	0	0	0	26-28
28-30	0	0	0	0	0	0	0	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	28-30
30-32	0	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	30-32
32-34	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	32-34
34-36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34-36
36-38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36-38
38-40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38-40
>= 40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>= 40
UNDF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	UNDF

OBS : 41276(41276) SCALED: 41275.97 RATIO : 1.000

Figure 34 Paulus crossed with wind

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